2005 Census of Technology Report

"Making a Positive Difference Through Education and Service"
Dr. D. Kent King, Commissioner

August 2005

Table of Contents

I. Introduction

The Census of Technology (COT) is designed to assess Missouri's continuing investment in K-12 education technologies and to help guide forward efforts. It provides important data for the Department of Elementary and Secondary Education (DESE) to share with state and national decision-makers to increase public awareness and advance public policy and support for education technology. It provides local school districts with data to help identify needs and develop strategies to facilitate school improvement processes and compare district progress with statewide data. The COT is aligned with the *2002-2006 Missouri Education Technology Strategic Plan* (METSP) and is a primary data source for measuring progress toward meeting the state goals and objectives. A cross reference of the 2005 COT items and the METSP goals and objectives is provided as an appendix to this report.

A technology survey has been collected annually since 1997. Prior to 2001, DESE contracted with the University of Missouri's Office of Social and Economic Data Analysis to administer the project. In 2001, the census was incorporated into the April cycle of DESE's online core data collection system. The 2001 COT was the first to be completed by all districts; data collected prior to 2001 were adjusted to estimate the entire population.

The COT has two parts: a district-level survey and a school building-level survey. The District Census assesses the levels of planning and training for the district as a whole and concentrates on hardware, software, and levels of connectivity for the administrative buildings and offices. Completed by district-level administrators and/or technology specialists, the District Census includes information for all Missouri school districts (524).

The Building Census assesses planning and training needs for individual school buildings and focuses on hardware and levels of Internet connectivity in computer labs, libraries, and classrooms. Completed by building-level administrators or technology contacts, the Building COT collects data from preschools, elementary schools, middle schools, junior high schools, high schools, area career centers, and the majority of charter schools (those in operation at least one full year prior to the Census date). Exempted buildings include juvenile centers, special education cooperatives, buildings where attendance is reported at another building (such as a gifted center), or other buildings with no enrollment data.

This *2005 Census of Technology Report* arranges the 2005 data for both the district and building levels according to the following areas: technology planning, technology professional development, hardware and support, Internet connectivity-distance learning, technology usage, and technology funding. Where feasible and appropriate, this report presents and compares information from previous years. Aggregated responses for the district and building census forms are provided in the Appendix section of this report.

This report is one of several documents that examine the use and effectiveness of education technologies in Missouri. Other evaluation information can be found in the Missouri Education Technology Strategic Plan reports, eMINTS Program research reports, annual technology program reports, project descriptions, and annual evaluation narratives – all of which may be accessed from the Instructional Technology website at http://dese.mo.gov/divimprove/instrtech.

For additional information regarding the Census of Technology, contact the Instructional Technology section by telephone at 573-751-8247or email at instrtech@dese.mo.gov.

II. Executive Summary

A. Overview

The Census of Technology continued to show modest gains in the past year. While modest, the gains represent consistent improvement in Missouri's schools with regards to technology readiness and use during the 2004-2005 school year. Despite another year afflicted with sluggish economies at the state and local levels and significant decreases in state funds (including another year of not funding the Technology Acquisition Grant Program), Missouri schools continued to improve access to education technologies for administrators, faculty, staff, and students and report increases in their quality uses of those technologies.

While advancements are slight, the 2005 data indicate that more schools are connected to one another and the Internet and more educational technologies are provided for teachers and students. Students, teachers, and administrators continue to become better skilled in using education technologies and, more importantly, continue to increase the frequency in which they use the technologies in meaningful ways.

INTERNET ACCESS
- Of the 2,211 school buildings reporting, over 2,100 or 95 percent have a partial T1 or higher Internet connection.

COMPUTER ACCESS
- Out of the 288,926 computers located across the buildings, over 270,000 computers (94 percent) are located in instructional rooms: 160,797 in classrooms, 87,260 in computer labs, and 22,284 in library media centers
- The 2005 number of students per computer (all computers located across all buildings) is 3.09, compared to 3.26 in 2004, 3.29 in 2003 and 3.8 in 2002 and 2001.
- The number of students per computer in all instructional rooms is 3.3, compared to 3.48 in 2004, 3.66 in 2003, 4.21 in 2002, 4.34 in 2001, 4.65 in 2000, 6.4 in 1999, and 8.15 in 1998.
- The number of students per computer in classrooms is 5.55, compared to 5.89 in 2004 and 6.42 in 2003.

Students per Computer in Instructional Rooms 1998-2005
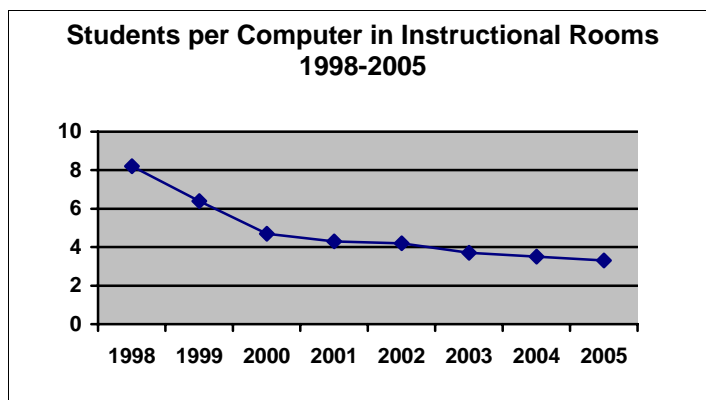
> ➢ The number of students per computer in instructional rooms has decreased from 8.15 students in 1998 to 3.3 students in 2005.

PRINCIPAL TECHNOLOGY SKILLS
- Approximately 91 percent of principals have intermediate and/or advanced technology skills, compared to 92 percent in 2004, 90 percent of principals in 2003 and 82 percent in both 2002 and 2001.
- Schools report that 97 percent of the principals routinely use email – the same rate reported in 2004 and 2003, and compared to 92 percent in 2002 and 74 percent in 2001.

- The rate of principals routinely conducting online research is 79 percent, compared to 80 percent in 2004, 79 percent in 2003, 69 percent in 2002, and 58 percent in 2001.

TEACHER TECHNOLOGY SKILLS
- Schools report that 78 percent of teachers routinely use educational software, the same percent as in 2004, and compared to 76 percent in 2003, 71 percent in 2002, and 59 percent in 2001.
- The rate of teachers routinely using technology for lesson plan preparation is 66 percent, the same percent in 2004, and compared to 64 percent in 2003, 59 percent in 2002, and 45 percent in 2001.
- In 2005, 81 percent of teachers have intermediate and/or advanced technology skills, compared to 81 percent in 2004, 79 percent in 2003, 76 percent in 2002, and 72 percent in 2001.

> The percent of teachers with intermediate and advanced technology skills has increased from 59 percent in 1998 to 81 percent in 2004 and 2005.

Percent Teachers with Intermediate and Advanced Skills 1998-2004
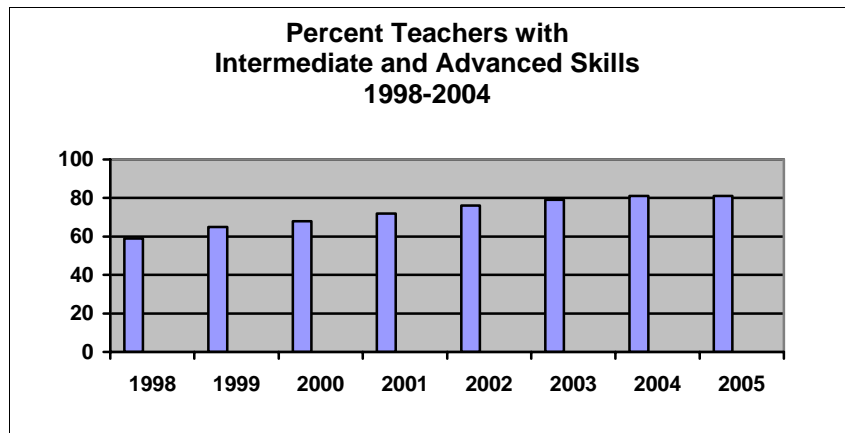
STUDENT TECHNOLOGY SKILLS
- Schools report that 80 percent of students routinely use educational software, compared to 81 percent in 2004, 80 percent in 2003, 75 percent in 2002, and 62 percent in 2001.
- Approximately 90 percent of eighth-grade students are technology literate.

B. Bulleted List of Findings

TECHNOLOGY PLANNING
- All districts have state-approved technology plans
- 2,156 school buildings (98 percent) have building technology plans

TECHNOLOGY PROFESSIONAL DEVELOPMENT
- 90 percent of districts have board-approved education technology standards
  - 82 percent have locally developed standards and 29 percent have adopted the National Educational Technology Standards (NETS)
  - 87 percent have standards for middle school/junior high students (grades 6-8), compared to 84 percent for students in grades 3-5, 81 percent for PreK-2 elementary students, and 74 percent for high school students (grades 9-12)
  - 79 percent have standards for teachers, 77 percent for school administrators, and 69 percent for support services staff

- The percentages of staff with intermediate and/or advanced skills in the use of education technology are as follows:
  - 98 percent of technology staff
  - 91 percent of school building administrators
  - 81 percent of teachers
  - 69 percent of school services staff
- 345 buildings report having a total of 1,070 eMINTS-trained teachers

HARDWARE AND SUPPORT
- On average, districts provided 2.73 FTE for technical maintenance and support
  - School building technical support was most likely provided by district staff, followed by school certificated staff and other school staff
- School buildings provide access to 288,926 computers
  - 85 percent are PC or PC-compatible and 15 percent are Apple/Mac
  - 94 percent of all computers are located in a classroom, computer lab, or library media center (LMC)
- The typical time-frame for resolving technical problems and repairs is two-to-three working days

INTERNET CONNECTIVITY AND DISTANCE LEARNING
- 87 percent of the districts have district-managed networks that connect all district buildings
- Most district networks support:
  - accounting/payroll – 98 percent of districts
  - student attendance – 93 percent of districts
  - email/communications and library catalog – 91 percent of districts
  - food service – 80 percent of districts
  - discipline reports – 77 percent of districts
- 95 percent of the school buildings have a partial T1 or higher Internet connection
- Buildings support distance learning systems
  - cable television – 1,140 buildings
  - interactive television – 485 buildings
  - satellite reception – 400 buildings
  - desktop videoconferencing – 270 buildings

TECHNOLOGY USAGE
- 99 percent of districts report having technology integrated into one or more core content curriculum:
  - 96 percent – communications arts
  - 90 percent – science
  - 88 percent – mathematics and social studies
- Almost all districts provide email accounts to staff:
  - 96 percent – school administrators
  - 94 percent – teachers
  - 90 percent – other district staff
- Fewer numbers of districts provide email accounts to students:
  - 108 – high schools students
  - 51 – middle school students
  - 33 – students in grades 3-5
  - 13 – students in PreK-2

- Buildings report the following routine use of technology, by application and user type

Application	Administrators	Teachers	Students
Educational software	43%	78%	80%
Email	97%	92%	11%
Electronic Resources:			
EBSCO host	17%	23%	21%
Electronic encyclopedia	15%	31%	33%
Gale	3%	6%	7%
Newsbank	4%	6%	6%
ProQuest	2%	3%	3%
SIRS	2%	5%	5%

- Buildings estimate the following routine uses of technology, by function and user type

Function	Administrators	Teachers	Students
Produce media, web, or multimedia products	54%	48%	40%
Produce written or print products/presentations	79%	79%	59%
Communicate with peers, experts, others	93%	85%	20%
Communicate with parents and students	81%	72%	13%
Conduct online research	79%	75%	53%
Participate in online courses (this year)	11%	11%	2%
Manage student records	82%	73%	NA
Track student performance	80%	75%	NA
Assess student performance	71%	70%	NA
Deliver and present instruction	37%	57%	NA
Prepare lesson plan(s)	11%	66%	NA

- Leadership and support of teachers in integrating technology is provided by:
  - library media specialist – 58 percent of buildings
  - school administrator – 53 percent of buildings
  - teacher – 52 percent of buildings
  - district technology staff – 47 percent of buildings
  - instructional technology specialist – 34 percent of buildings
- Buildings estimate that 50 percent of the teaching staffs fully integrate technology into the curriculum
- Almost all buildings have one or more technology-mediated feedback systems:
  - email – 2,075 buildings
  - voice mail – 1,115 buildings
  - homework hotlines via the web – 611 buildings
  - automated absentee calling systems – 416 buildings
  - homework hotlines via the telephone – 331 buildings
  - listservs – 287 buildings

TECHNOLOGY FUNDING
- Districts projected spending $105.9 million in 2004-05 for technology-related activities and purchases
- 414 districts (79 percent) applied for E-rate discounts in 2004-05:
  - districts projected a total of $29.7 million in discounts
  - 80 percent of the discounts are used to support education technology

III. Detailed Findings

This section of the *2005 Census of Technology Report* details all of the district- and building-level data, compares current data with previous years' data, and makes note of trends and/or anomalies found in data from the last several years.

A. District Census

All 524 Missouri school districts completed the COT in 2005. The District Census is a quick survey, comprised of 11 items that address technology planning, standards, administrative systems and support, and budgeting. See Appendix A for copies of the district and school building surveys, completed with aggregated data, and Appendix B for a cross reference of the 2005 COT items and the Missouri Education Technology Strategic Plan (METSP) goals and objectives.

Even with the continued loss of state funding (i.e., the Technology Acquisition Grant or TAG program), district responses to the 2005 COT indicate continued progress in technology readiness and use. Missouri districts appear to be making effective use of technology for administrative purposes, managing networks and systems that help improve district administration, data management, and communication.

TECHNOLOGY PLANNING
The district-level COT examines the presence of a board-approved and state-approved long range education technology plan. A school district's long-range technology plan provides a road map for how the district will implement strategies that promote the district's mission, advance its comprehensive school improvement plan, and improve teaching and learning through the use of education technologies. DESE began approving technology plans in 1997 as a requirement for the E-rate program. Beginning in 1999, a state-approved technology plan became a requirement for participation in the state's technology grant programs and the MOREnet Technology Network Program. With the passing of the federal No Child Left Behind Act in 2001, DESE developed the 2002-2006 Missouri Education Technology Strategic Plan and updated accordingly the scoring criteria used to approve district education technology plans.

Early district technology plans dealt mostly with hardware and equipment and did little to address integration, student learning, or technology professional development. Now plans are much more comprehensive, as a result of the state plan and the scoring criteria for local plans both focusing on the development of plans that align with comprehensive school improvement plans and promote effective teaching strategies, student achievement, and adequate infrastructure and technical support.

Item 1 – State-approved technology plans
All districts have state-approved district technology plans, with 417 districts having their plans approved in 2003, 66 districts in 2004, and 51 districts in 2005. By June 2004, all districts had a plan approved using the scoring guide developed in 2002 in response to the No Child Left Behind Act and the 2002-06 Missouri state plan.

TECHNOLOGY PROFESSIONAL DEVELOPMENT
Professional development is a critical factor in teachers using technology in meaningful and effective ways. In November of 1997, the State Board of Education established policy that required buildings to allocate amounts equal to 20 percent of state technology grant funds for technology-related training. The policy went into effect for the 1998-1999 school year. The

Title II.D (Ed Tech) Program, begun in 2002-2003, requires that 25 percent of formula and/or competitive grant funds be earmarked for professional development.

Data collected over the previous years indicate that teachers are increasingly interested in professional development sessions that address how to integrate technology into curriculum and instructional teaching strategies. Professional development is most effective when tied to comprehensive school improvement plans and to local, state, and national educational technology standards. The Missouri technology plan endorses the National Educational Technology Standards (NETS) for students, teachers, and school administrators developed by the International Society for Technology in Education (ISTE).

Item 2 – Educational technology standards
Added to COT in 2003, item two asked about the educational technology standards in place in the district. Standards provide guidelines for developing curriculum and guiding teacher and student behavior; they define a common agreement on what ought to be taught or learned. Also, educational technology standards serve as guidelines for planning technology-based activities in which students achieve success in learning communication and life skills.

In 2005, the vast majority of districts (90 percent) report having board-approved educational technology standards. Figure 1 shows that four out of five (431) districts have standards developed by the district, with nearly three of ten (151) having adopted the National Educational Technology Standards, and one in sixteen (42) adopting the Standards for Technological Literacy (STL) endorsed by the International Technology Education Association (ITEA). Nineteen districts report having other standards, while 55 districts (10 percent) report having no board-approved standards. The 2005 data closely parallel the data collected in 2004 and 2003, but also show a modest increase in the number of districts adopting the NETS (as proposed in the state plan) and a decrease in the number of districts having no board-approved standards. Many of those districts adopting the NETS also incorporate locally-developed standards.

Figure 1

Percent Districts with Education Technology Standards, by Standard Type, 2003-2005
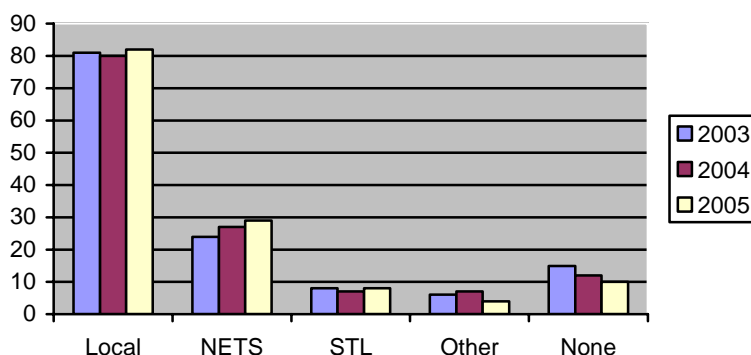
Ninety percent of districts reporting having technology standards for students: 426 districts have established standards for PreK-2 students, 440 have standards for students in grades 3-5, 457 have standards for middle school students (grades 6-8), and 388 have standards for high school students. Nearly three of four districts (74 percent) that house area career centers also indicate having standards for career center students. The number of districts with established technology standards has increased for all grade levels each year since 2003, as indicated in Figure 2.

Figure 2

**Number Districts with Student Technology Standards, by Grade Spans, 2003-2005**
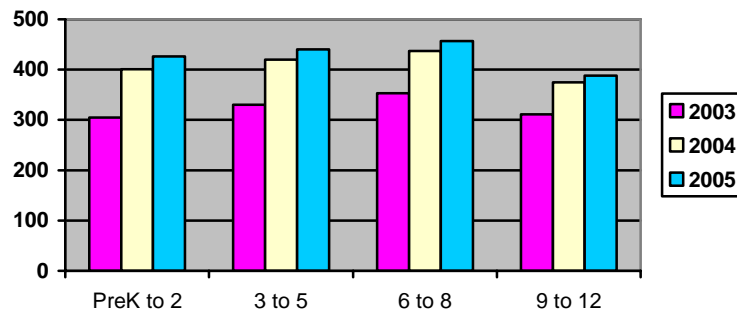
Four of five districts (80 percent) report having technology standards for district employees: 412 districts have standards for teachers, 403 have standards for administrators, and 360 have standards for support services staff. Similar to the status of student standards, the number of districts that report having educational technology standards for school employees has increased from 2003 to 2005, as illustrated in Figure 3 below.

Figure 3

Number Districts with Technology Standards for Faculty/Staff, by Employee Type, 2003-2005
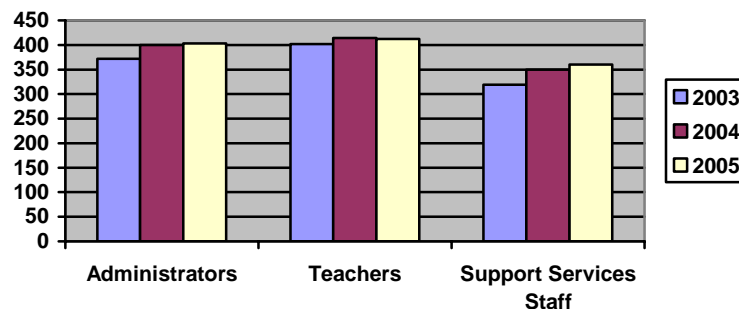
HARDWARE AND SUPPORT
Technology integration is affected by the kinds of hardware and software that districts deploy. The district COT looks at who is responsible for technology hardware and support in the district, the administrative technologies in place in the district, and computer networking. Access to current technologies is an essential condition for district operations as well as for teaching and learning. Technology is essential to effective and efficient district administration, data management, and communications. Having district technology staff to help plan, purchase, install, and support district technologies is key.

Item 3 – District technology staff
Item three asked districts to estimate the total number of district-level, full-time equivalent (FTE) staff responsible for technical maintenance and support. Overall, districts report having an average of 2.1 technical staff, which is only slightly higher than the 2.09 reported in 2004. The typical (median) district has only one full-time staff. In 2005, 18 districts report having no staff dedicated to overseeing district hardware and support.

<u>Item 4 – District-supported administrative systems</u>
Added in 2004, item four examines district administrative systems – programs that are used to expedite the storage and use of data and information. Table 4 details the systems supported by a majority of the districts. Almost all districts (513) have accounting systems, and over 90 percent of districts support automated student attendance, electronic mail (email), and library catalog. Systems supported by less than half of the districts include school safety (104 districts), teacher evaluation (133 districts), instructional management (136 districts), human resources (166 districts), extracurricular scheduling (190 districts), and distance education (194 districts).

Table 4

District Administrative Systems, 2004 and 2005

System Type	Number of Districts	
	2005	2004
Accounting/budgeting/payroll	513	511
Student attendance	488	461
Communication/email	478	452
Food service	420	431
Library catalog	475	432
Discipline	402	355
Health service	374	346
IEP management	382	345
Student performance	341	304

<u>Item 5 – District networks</u>
The use of an interconnected system of computers and peripheral equipment enables connected users to communicate and share information and resources. Revised this year, item five assumes that districts have computer networks and asks how many districts have all buildings in the district connected through a wide (WAN) or local area (LAN) network. In 2005, nearly nine of ten (87 percent) districts report all buildings being connected through a wide or local area network.

TECHNOLOGY USAGE
Previous items examined technology readiness, with integrating technology as the goal of making technology available and accessible. Technology usage items look at technology integration, the incorporation of technology resources and technology-based practices into daily routine – of districts, school employees, teachers, and students. At the district level, technology usage items check to see how districts support a culture that embraces technology and accepts technology as natural to the business of everyday work. Major goals of the Title II.D Program call for all districts to have technology integrated into core curricula and for students to be technology literate by the end of the eighth grade.

<u>Item 6 – Curriculum integration</u>
Technology integration in Missouri is defined as "written curriculum that incorporates content and processes (teaching, professional development, and assessment) related to technology resources, equity of resources, research and workplace readiness skills. Technology supports overall goals and objectives and makes possible and enhances the use of multiple instructional resources and teaching strategies (e.g., use of project-based learning, collaborative and cooperative learning, ongoing questioning, expert assistance, and critical analysis)". As depicted in Figure 5, districts report technology is integrated in communication arts for 505 districts (96 percent), science for 474 districts (90 percent), mathematics for 463 districts (88 percent), and social studies for 462 districts (88 percent) in 2005.

Figure 5

Percent Districts with Technology Integrated in Curriculum, by Subject, 2003-2005
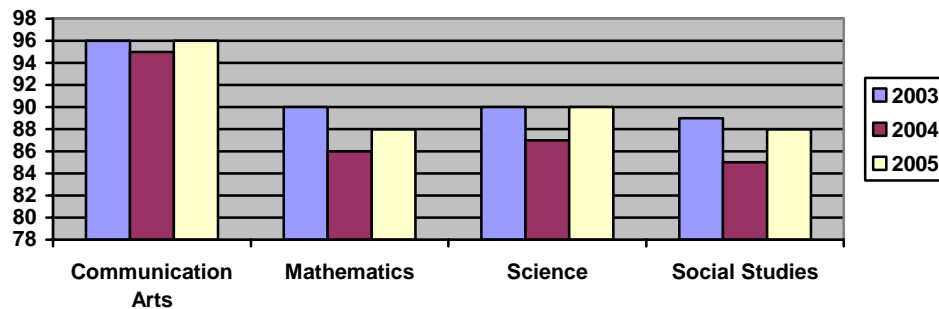
In 2004, the state upgraded the definitions and/or standards related to technology integration, student technology literacy, and teacher technology integration skills in order to better align with national standards (NETS). The dip noted in 2004 of the percentages of districts reporting to have technology integrated in the core curriculum areas is a reflection of the revised definition for integration. The increases for 2005, therefore, indicate more than just modest improvement.

Item 7– District-provided email
Districts, for item 7, indicate the percentage of employees (by type) and students (by grade-level spans) who are provided email accounts. Table 6 shows that nearly four of five (79 percent) districts provide email accounts to employees, but fewer than one-fourth of districts provide accounts to students. While similar to data collected in 2003, the 2005 data represent decreases from 2004. District that do provide staff email accounts, however, typically provide accounts for all administrators, teachers, and support staff.

Table 6

District Email Accounts, 2003-2005

Population	2003	2004	2005
District Employees			
• School administrators	504	515	502
• Teachers	499	510	495
• Support services staff	477	494	472
Students			
• Pre K-2	31	22	13
• 3-5	58	51	33
• 6-8	81	72	51
• 9-12	108	125	108

Item 8 – Technology literacy
In 1997, COT began asking districts to estimate the percentage of sixth-grade students who are computer literate, a goal set forth by Governor Mel Carnahan in January of 1997. In 2004 the item was revised to address "technology literacy" rather than "basic computer skills" and revised again in 2005 to address eighth-grade students. These revisions better align the COT item with the Title II.D technology literacy goal.

In 2005, the typical (median) district reports 90 percent of eighth-grade students as meeting the technology literacy standard as established by the state. Aligned to the NETS for students, a

12

literate student is able to "apply strategies for identifying and solving routine hardware and software problems that occur during everyday use; exhibit legal and ethical behaviors when using information and technology; use content-specific tools, software, and simulations to support learning and research; design, develop, publish, and present products using technology resources that demonstrate and communicate curriculum concepts, and select and use appropriate tools and technology resources to accomplish a variety of tasks and solve problems."

TECHNOLOGY FUNDING
Districts are asked about their technology funding habits to study budget trends with regards to how much districts spend on technology and how districts make use of the national E-rate program.

<u>Item 9 – Technology budgets</u>
Revised in 2005, this item simply asks for the total amount budgeted for technology for the current year. As noted in Table 7, districts estimated spending a total of nearly $106 million during the 2004-2005 school year. While higher than budgeted last year, the 2005 total falls short of the nearly $108 million budgeted in 2003. While the average is $202,025 in 2005, that amount is inflated by the number of larger schools with access to greater resources. The typical (median) district budgeted $40,900.

Table 7

District Technology Budgets and Expenditures, 2002-2005

Technology Budget Items (in millions)	2003	2004	2005
Hardware/Equipment	$45.057	$37.188	NA
Instructional Software	12.784	5.077	NA
Administrative Software	5.486	6.609	NA
Professional Development	7.902	7.438	NA
Connectivity-Distance Learning	5.456	5.473	NA
Technical Support	17.974	17.423	NA
Infrastructure/Retrofitting/Other	13.334	11.360	NA
Total	$107.993	$90.569	$105.861

<u>Items 10 and 11 – E-rate discounts</u>
Item 10 asked districts if they participated in the Universal Service Fund's E-rate program for 2004-2005 and the estimated amount of discounts/savings, while item 11 asked what percent of the discount received by the E-rate program is used to support education technology activities and expenditures. While MOREnet files an E-rate application on behalf of the 510-plus districts and state schools that participate in the statewide network project (TNP), items 10 and 11 refer to district-filed applications for E-rate discounts.

In 2005, 414 districts (70 percent) report applying for E-rate discounts and receiving funding commitment decision letters (FCDLs) that total nearly $29.7 million. These figures compare to 381 districts (73 percent) in 2004 with discounts totaling $32.55 million, and 374 districts (71 percent) in 2003 with discounts totaling over $41 million. Districts projected that 80 percent of the savings being used to support technology-related activities and expenditures, compared to 74 in 2004 and 61 percent in 2003.

B. School Building Census

This section of the *2005 Census of Technology Report* analyzes data from 2,211 buildings, compared to 2,207 buildings in 2004 and 2,250 buildings in 2003. While all buildings in the state complete the School Building Census Form, the report only covers those buildings with regular student populations. Data from juvenile centers, special education cooperatives, and other buildings (such as a gifted center) where attendance is reported at another building are not included in this report.

The school census is comprised of 19 items that are aligned to the Missouri State Education Technology Strategic Plan (METSP) and its five technology focus areas. Items examine access and distribution of the building's technology resources, technical support, teacher and student technical skills, and the routine uses of technology by user and technology type or function. A copy of the survey, with aggregated data, is provided as Appendix A, and Appendix B provides a cross reference of the 2005 COT items and METSP goals and objectives.

Overall, the 2005 data indicate some continued improvements in the kinds and numbers of technologies that can be accessed in Missouri's school attendance centers as well as in the ways school administrators, teachers, and students are using those technology resources. A good number of the gains are modest, at best, and likely a result of the tight budget year as explained earlier in this report. Some of the differences (or the magnitude of differences) noted in data from 2003 to 2005 can likely be attributed to the setting of higher standards (i.e., the changes in definitions for technology literacy and full integration) as described earlier, and to the change in reporting only buildings with regular student attendance. This is not to say there aren't areas that show more noteworthy increases.

TECHNOLOGY PLANNING
As with the district COT, the building census examines the presence of a long-range technology plan.. A school building plan, like a district plan, should provide a road map to help the school implement strategies that promote the district's mission, advance district and building improvement plans, and improve the teaching and learning occurring in the building.

Item 1 – Building technology plans
Building contacts are asked if buildings have technology plans and, if so, whether they are stand-alone plans and/or are embedded in district plans. Table 8 indicates the percentage of school buildings that have technology plans, the percentage of building plans that serve as stand-alone plans, and the percentage of plans that are included in district plans. Data show a continued trend in buildings having technology plans, starting with only 69 percent of buildings having plans in 1998 to 98 percent having plans in 2005.

Table 8

Status of Building Technology Plans, 1998-2005

	1998	1999	2000	2001	2002	2003	2004	2005
Building has a technology plan	69%	83%	83%	83%	83%	95%	97%	98%
Plan is part of the district technology plan	64%	96%	96%	96%	96%	88%	89%	92%
Building has a stand-alone plan	NA	NA	NA	NA	NA	6%	7%	6%

TECHNOLOGY PROFESSIONAL DEVELOPMENT
The use of technology in the school setting requires professional development aimed at helping educators integrate the appropriate education technologies into curriculum content, instructional teaching strategies, and the day-to-day business of teaching and learning. Teachers, administrators, and school services staff need regular, ongoing, and quality professional development that helps them gain the confidence and skills needed in using the school's technologies in ways that promote district and school improvement plans and align with Show-Me Standards, board-approved curriculum, and board-approved educational technology standards.

Item 2 – Technology skills of building staffs
Building contacts are asked to estimate the technology-related skill levels of principals, teachers, technology support staff, and support services staff. The skill level options are: Beginner – basic technical skills including applications such as word-processing, some stand-alone software, and some Internet usage (email); Intermediate – regular use of applications, software, and Internet resources for increased productivity and the use of applications including word-processor for student writing, research on the Internet, computer-generated presentations; and, Advanced – complete integration and mastery of the technology, using it effortlessly as a tool to accomplish a variety of learning, instructional and/or management tools.

Since 1998, the percentages of staffs with beginner skills have decreased steadily while the percentages with advanced skills have increased. The proportion of teachers estimated as beginner technology users has decreased from 40 percent reported in 1999 to 19 percent reported in 2004 and 2005. The rate of administrators (e.g., principals) estimated as having beginner skills has decreased from 35 percent in 1999 to eight percent in 2004 (slightly lower than the nine percent reported for 2005).

Figure 9 illustrates the increase in the percentages of teachers, building administrators, and technology staff rated as having advanced technology skills from 1998 through 2005. (Note that the support services staff category was not included until 2003 and is addressed later.) The rates of teachers and principals reported as advanced users have nearly doubled from 11 to over 20 percent. The group with the highest rate of advanced skills includes technology support staff, at 82 percent in 2005 as compared to 54 percent in 1998.

Figure 9

**Percent Faculty/Staff with Advanced Skills, 1998-2005**
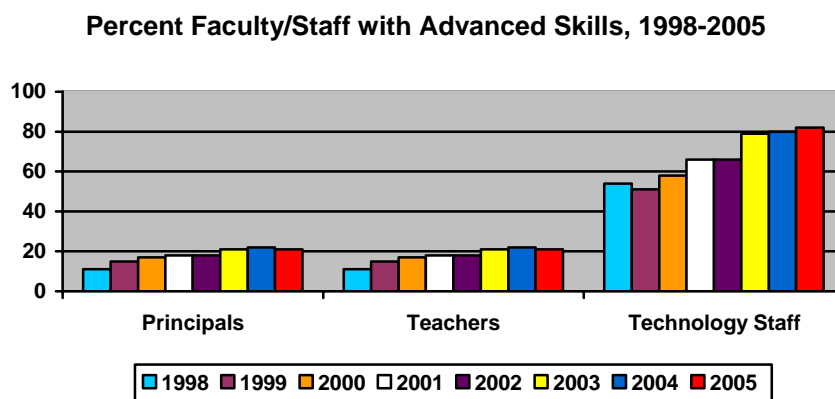
As mentioned above, the Census did not address skill levels of support services staff until 2003. Interestingly, these data have been stagnant, with 52 percent of support services staff rated as having intermediate skills in 2003, 2004, and 2005. Also, the percentages of staff rated as

beginner or advanced have fluctuated little, ranging from 29 to 31 percent as beginners and 17 to 19 percent as advanced. The differences are somewhat less marked among the user groups when reporting on combined intermediate and advanced skills, as indicated in Figure 10. Almost all of the technology staffs (98 percent) have intermediate or better skills. Principals are close behind at 91 percent, followed by teachers at 81 percent, and support services staff at 69 percent.

Figure 10

Percent Faculty/Staff with Intermediate or Advanced Skills, 1998-2005
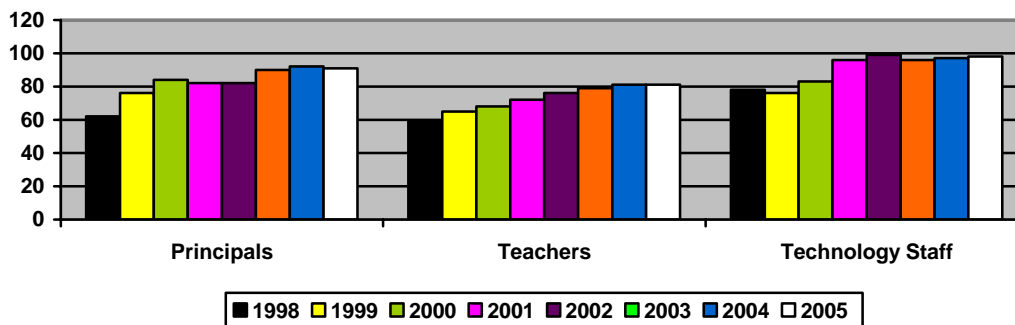
Item 3 – Number of eMINTS-trained teachers

Added in 2004, item three asked schools to report the number of teachers in the building who have completed one or both years of eMINTS professional development. The *enhancing* Missouri's Instructional Networked Teaching Strategies (eMINTS) program – that serves as the state's instructional model of technology integration – supports teachers as they learn to integrate multimedia technology into inquiry-based, student-centered, interdisciplinary collaborative teaching practices that result in improved student performance, increased parent involvement, and enriched instructional effectiveness. While the majority of eMINTS-trained teachers received their professional development from eMINTS instructional staff, more and more teachers are receiving their professional development through district staff that has completed the eMINTS program's "train-the-trainer" professional development.

In 2004, contacts from 273 buildings reported having 594 teachers with one or both years of eMINTS professional development. For 2005, these numbers increased to 1,071 teachers in 345 buildings. Figure 11 indicates the numbers of staff reported in 2004 and 2005 as having completed one or both years of the eMINTS professional development for teachers.

Figure 11

Numbers of eMINTS-Trained Teachers, By Number of Years of Training, 2004 and 2005

16
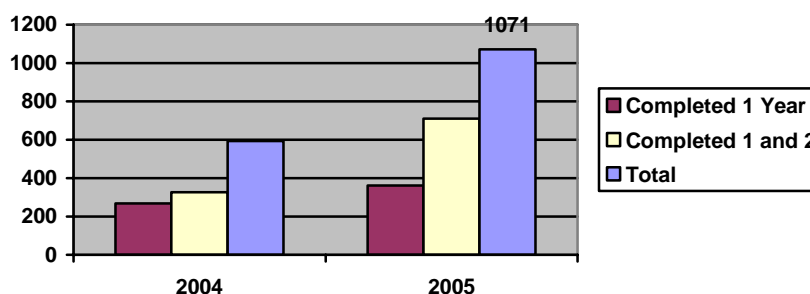
HARDWARE AND SUPPORT
Hardware and support items deal with technology access and support issues at the building level. These items cover the level of technical support, the numbers of computers by type and location (and student per computer ratios), and the use of a library automation system.

Item 4 – Building technical support
Building contacts were asked in item four to estimate the total of school staff or others directly responsible for technical maintenance and/or support of the building's hardware. Table 12 indicates the number and percentage of buildings, and where appropriate the full-time equivalency (FTE), relying on the various types of technical support provider. In general, buildings engage employees rather than non-employees to provide such support. In 2005, all but 94 buildings reported having one or more employees, with nearly three of four buildings relying on district technical staff with an average of 2.66 FTE staff per building. In total, buildings reported an average of 2.73 FTE employees providing technical support. However, the typical (median) building has closer to one employee responsible for support.

Table 12

Building Technical Support – 2005

Employees			Non-Employees		
1754	79%	District staff – FTE: 2.66	281	13%	Students
679	31%	School certificated staff – FTE: 1.19	34	2%	Parents/community
534	24%	School non-certificated staff – FTE: 1.05	716	32%	Vendors/contractors
94	4%	None	1278	58%	None

The 2005 technical support data correspond closely with data collected in 2003 and 2004, as shown in Table 13. Following building-level technical support being provided by district-level staff, the next likely providers of support are certificated staff, vendors, and/or non-certificated staff. While few buildings rely on parent/community support, the percent of buildings making use of student assistance has increased from five to 13.

Table 13

Building Technical Support Providers, 2003-2005

Technical Support Provider	Buildings Responding		
	2003	2004	2005
District staff	50%	78%	79%
School certificated staff	26%	36%	31%
School non-certificated staff	19%	21%	24%
Vendor/Contractor	18%	18%	32%
Students	5%	9%	13%
Parents/Community	2%	2%	2%

Items 5 and 6 – Computers in the building
Annually, buildings report on the types and locations of computers in the buildings. Item five counts computers by platform and speed capacity, and item six counts Internet-connected and multimedia-equipped computers. Locations include Computer Labs, specifically designated for computer work; Instructional Rooms, designated as classrooms; and Library/Media Centers, designated for library and media services. In 2005, the Instructional Rooms were further broken out, by the grade spans of PreK-2, 3-5, 6-8, 9-12, and area career center. The handheld computer was also added to item five in 2005.

As indicated in Table 14, buildings reported a total of 288,926 computers in 2005 – a six percent increase from the 273,636 building computers reported in 2004. About 85 percent of the computers are PC or PC-compatible, (91 percent are connected to the Internet, 86 percent can operate multimedia programs, and 94 percent are considered Internet-capable. For 2005, the standard for being considered Internet-capable (or modern and able to run the Internet at high speeds) was updated to include: PC computers that run at Pentium or Pentium-equivalent speeds, Power Mac or G series Apple Computers, and AMD computers at or above 450 MHz.

Approximately 93 percent of all computers are located in instructional rooms (computer labs, classrooms, and library media centers). With the inclusion of handhelds, the total number of computers jumps to over 299,000. Overall, the 2005 data indicate increases in all categories of computers, except for the numbers and percentages of computers that are "Internet-capable" as explained above, and the numbers and percentages of computers located in lab settings because of the shift in moving computers out of labs and into classrooms.

Table 14

**Numbers, Types, and Location of Computers, 1998-2005**

	1999	2000	2001	2002	2003	2004	2005
Total number of computers	176,148	206,864	237,115	232,808	270,368	273,636	288,926
Located in Instructional Rooms	158,908	187,298	219,188	211,382	242,981	257,347	270,342
▪ Percent of all computers	90%	91%	92%	91%	90%	94%	93.4%
Located in Classrooms	83,238	101,278	119,450	116,832	138,672	151,962	160,797
▪ Percent of all computers	47%	49%	50%	50%	51%	56%	56%
▪ Percent-instructional rooms	52%	54%	54%	55%	57%	59%	59%
Located in Computer Labs	60,815	69,319	81,057	77,373	83,897	84,162	87,260
▪ Percent of all computers	35%	34%	34%	33%	31%	31%	30%
▪ Percent-instructional rooms	41%	37%	37%	37%	35%	33%	32%
PC/PC-compatible	120,888	148,473	177,916	185,901	221,285	228,784	245,654
▪ Percent of all computers	69%	72%	75%	80%	82%	84%	85%
Modern/Internet-capable	136,165	173,774	195,826	226,127	254,908	265,591	270,609
▪ Percent of all computers	77%	84%	83%	97%	94%	97%	94%
Multimedia Equipped	91,354	131,490	170,807	190,353	211,124	234,377	247,305
▪ Percent of all computers	52%	64%	72%	82%	78%	86%	86%
Internet Connected	105,872	145,221	179,509	205,068	222,522	244,976	261,932
▪ Percent of all computers	60%	70%	76%	88%	82%	90%	91%

The 2005 data continue to document the shift in the location of computers. Since 1999 the range of computers located in a lab setting has ranged from a high of 36 percent in 1998 to a low of 30 percent in 2005. The percentage of computers residing in classrooms has increased from 47 percent in 1999 to 56 percent in 2004 and 2005. The shift is more noticeable when looking at the placement rates of computers within the instructional settings. In 2005, only 32 percent of "instructional" computers are located in labs as compared to 41 percent in 1999. The percent of "instructional" computers in classrooms has grown from 52 percent in 1999 to 59 percent in 2005.

Figure 15 indicates the numbers of students per computer for 1998 through 2005. Ratios are determined using the COT data regarding numbers and types of computers and Core Data fall enrollment figures. As schools purchase new computers, older computers may be relocated

within or surplussed out of the district. The numbers of computers in use continue to climb, resulting in a steady decline in the numbers of students per computers. Ratios are declining related to the number of students per high-speed (Internet-capable) computer and Internet-connected computer. The greatest decline relates to Internet-connected computers, as more and more buildings, classrooms, and computers are being connected to the Internet. Overall, the number of students per all computers has dropped from 6.4 in 1998 to 3.09 in 2005; the number of students per Internet-capable computer has dropped from 8.3 to 3.3; and, the number of students per Internet-connected computer has dropped from 13.5 to 3.4.

Figure 15

Number of Students per Computer Type, 1998-2005
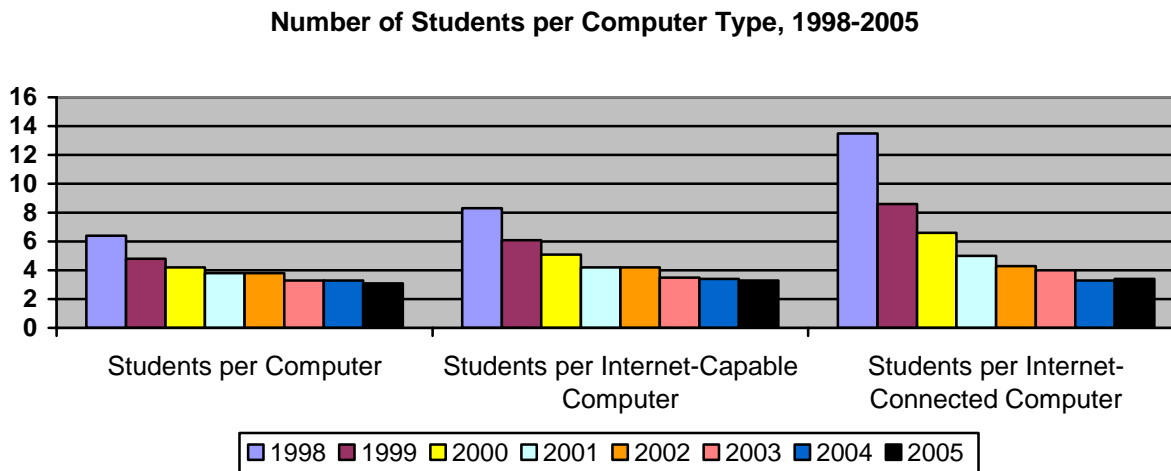
Item 7 – Computer Internet connections
For the second year, building contacts were asked to indicate the status of Internet connectivity by type of computer (desktop or laptop) and type of connection (wired or wireless). In both 2004 and 2005, nearly all desktop computers (98 percent) had wired connections to the Internet. In 2005, two of three laptops had wireless connectivity.

Item 8 – Technology in instructional rooms
Annually, buildings are asked to report on a list of technologies the state believes should be available in instructional rooms, based on current research and the eMINTS instructional model. These resources include telephone access, multimedia-equipped and Internet-connected computers, and teacher workstations that include a dedicated projection device (LCD panel or other type of video projector) and access to a printer.

Note that a technical problem makes it impossible to report 2005 data. Nonetheless, Tables 16 through 18 are provided to indicate progress noted prior to this year's reporting. The tables provide snapshots of the technologies located specifically in computer labs, instructional rooms, and library media centers (LMCs) for the base year of 1999, and 2002, 2003, and 2004. Overall, modest gains were noted in the majority of the technology categories.

In general, computer labs and LMCs have greater access to education technologies than do classrooms. For example, 87 percent of LMCs had phone access in 2004, compared to 63 percent of labs and 56 percent of classrooms. The lowest rates of access for all room types, not surprisingly, involve having the full suite of technology available, followed by telephone access. Note that the item about Internet access was changed in 2004 to indicate real access rather than "wired for" access, thus the expected drop in 2004.

Table 16

Computer Lab Technologies, 1999 and 2002 – 2004*

Computer Labs	1999	2002	2003	2004
Total	2,824	3,303	3,723	3,747
Number with telephone access	NA	61%	63%	63%
Number with Internet access	86%	96%	98%	92%
Number with multimedia-equipped computer	77%	91%	93%	92%
Number with Internet-connected computer	72%	86%	91%	93%
Number with complete teacher workstation	43%	43%	52%	58%

* Note: 2005 Data not available

Data for the computer labs changed very little from 2002 to 2004, with the 2004 data almost identical to the 2003 data. Only moderate increases are noted in the numbers of labs with Internet-connected computers and labs with complete teacher workstations. In comparison to the other room types, computer labs continue to have the highest rates of Internet access, multimedia-equipped computers, and Internet-connected computers.

Table 17

Instructional Room Technologies, 1999 and 2002-2004*

Instructional Rooms	1999	2002	2003	2004
Total	49,936	55,142	60,248	60,856
Number with telephone access	NA	49%	55%	56%
Number with Internet access	74%	96%	96%	92%
Number with multimedia-equipped computer	52%	85%	88%	89%
Number with Internet-connected computer	46%	79%	85%	88%
Number with complete teacher workstation	13%	18%	21%	24%

* Note: 2005 Data not available

Classroom technology has improved substantially over the years. Progress was continued in 2004, with gains noted for every category except for the upgraded Internet access data cell. While these gains are marginal, they are noteworthy given the state's decrease in funding in 2003-2004. Classrooms are approaching parity with labs with regards to having at least one multimedia-equipped and Internet-connected computer. Still, only just over half of the classroom teachers have telephone access in 2004, and only about one in four has access to the full suite of classroom technologies.

Table 18

Library Media Center Technologies, 1999 and 2002-2004*

Library Media Centers	1999	2002	2003	2004
Total	2,025	2,148	2,319	2,237
Number with telephone access	NA	85%	88%	87%
Number with Internet access	75%	93%	98%	89%
Number with multimedia-equipped computer	75%	88%	90%	90%
Number with Internet-connected computer	68%	84%	89%	90%
Number with complete teacher workstation	32%	27%	37%	43%

* Note: 2005 Data not available

Data have remained fairly constant for the LMCs during the past years, with a slight gain in the number of libraries with Internet-connected computers and a little larger gain in the number with the complete teacher workstation. For all years, LMCs indicate having telephone access at rates higher than those reported for computer labs and instructional rooms.

<u>Item 9 – Library automation systems</u>
Item nine deals with automated systems in place in building library media centers (LMCs). Table 19 lists the systems predominantly used during the past four years. While the top systems have remained the same, the number of automated libraries has jumped dramatically since 2002. Only 89 of the 2,211 buildings in 2005 indicate not having any automated system, compared to 200 buildings in 2004, and 237 buildings in 2003. Over 1,600 buildings (78 percent) in 2002 indicated that the card catalogs in the LMCs were not completely automated.

Table 19

Library Automation Systems, 2002-2005

Library System	2002	2003	2004	2005
Follett	153	696	748	767
Winnebago	133	362	412	417
Athena	85	322	318	335
Alexandria	35	145	151	152

<u>Items 10 and 11 – Technical maintenance and repair</u>
First addressed in 2003, item ten asked the length of time needed for technical problems or repairs to be resolved. Buildings report in 2005 that it typically takes two-to-three working days to resolve minor or routine technical problems or repairs – the same length of time reported in 2003 and 2004.

An item about the percentage of computers in working order on any given day was added in 2004. The typical (median) building had 98 percent of computers working in 2005, compared to 90 percent in 2004.

INTERNET CONNECTIVITY / DISTANCE LEARNING
This section of the COT deals with building networking, Internet, and interconnectivity issues. Items address the systems in place that facilitate quality, secure, and safe access to people and information both in and outside the school building.

<u>Item 12 – Internet bandwidth</u>
Table 20 profiles Internet access data reported since 2002, with ever increasing percentages of school buildings accessing the Internet through dedicated, direct means. In 2005, over 1,400 buildings report having a T1 (or split T1) line and 649 buildings report connectivity at higher speeds. Only 13 buildings report not having a direct connection to the Internet in 2005.

Table 20

Internet Access, 2001-2005

Number of buildings	2002	2003	2004	2005
Total number of buildings	2,128	2,250	2,207	2,211
Percent with Internet access	97%	98%	99%	99%

In 2005, item 12 also asked about the delivery mode. Figure 21 indicates the primary methods for accessing the Internet. Over 1,000 buildings (46 percent) have fiber connections, 846 (40 percent) have copper line, 131 (six percent) use wireless/point-to-point/frame relay, and 69 (three percent) have digital subscription, or DSL. The remaining buildings use some other mode of delivery (such as satellite).

Table 21

Internet Access Delivery Modes - 2005

Fiber ☐ Copper Line ☐ Wireless ☐ DSL ■ Other
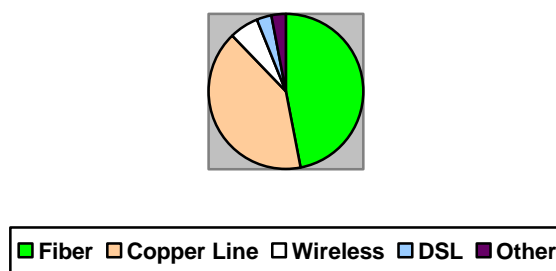
Item 13 – Computer networking
Originally, this item had two parts – about the percentage of computers in the building that are connected through a local or wide area network, and whether the building was connected to the district LAN or WAN. This item was revised in 2005 to deal only with computer networking. The part of the item that asked about building connectivity was moved to the district Census.

Table 22 shows an increase in the numbers of computers connected to a building (or district) network, from 88 percent of computers in 2003 to 96 percent presently. In 2005, the typical (median) building has all computers networked.

Table 22

Computer Networking, 2003-2005

	2003	2004	2005
Percent computers connected to building LAN (or district WAN)	88%	94%	96%

Item 14 – Distance learning systems
For several years, a distance learning item addressed accessibility to programming that is originated from outside of the building. The item was revised in 2005 to better define and distinguish among five options: Cable television and Satellite programming that incorporate one-way instructional video; Interactive television (or I-TV) and Desktop video-conferencing that provide two-way audio and video instruction; and Web-based online instruction that is Internet-based and non-interactive.

In 2005, three of four buildings report having at least one distance learning system available. This compares to four of five buildings in 2004, which can likely be explained by the change in options and the more formalized definitions of the options. With regards to systems in place, Table 23 shows the most commonly used system since 2002 is cable television. In the past four

years, more and more buildings have access to Web/Internet-based and interactive television instruction.

Table 23

Distance Learning Systems, 2002-2005

Distance Learning Systems	2002	2003	2004	2005
Cable television (one-way video)	285	1,371	1,276	1,140
Satellite programming (one-way video)	163	642	518	399
Interactive television (two-way interactive)	239	390	379	485
Desktop/IP-based videoconferencing*	205	1,107	893	270
Web-based, online instruction (non-interactive)	NA	NA	NA	703
None	NA	180	439	551

* Note: IP-based instruction was divided into two categories in 2005

TECHNOLOGY USAGE

The remaining building items address how building faculty, staff, and students use the education technologies available to them in school. Emphasis is placed on "routine" use, described as being used or implemented at least three times per week. As explained earlier in this report, the third cycle of the Missouri School Improvement Program (MSIP) requires districts to report these and similar data. Likewise, the scoring guide used for state approval of district technology plans places more emphasis on usage data. Both of these accountability measures factor in the following analyses.

Item 15 – Routine use of technology, by technology type

This item has typically asked how principals, teachers, and students have used educational software, the Internet, and electronic resources. The item also helps track the impact of state and federal funding that promote the use of educational technologies. Besides supporting the state network, the state appropriates funding to the Secretary of State's Office / State Library for the purchase of electronic resources that are made available to all network users via their MOREnet connection. In 2005, the item was revised to delineate electronic resources that include the following:

- EBSCOhost Electronic Journals Service – a gateway to thousands of journals containing millions of articles from hundreds of different publishers.
- Gale – numerous products focused on specific topics such as Authors or history.
- Newsbank – comprehensive database resource containing information from newspapers.
- ProQuest – a comprehensive digital database containing in-depth coverage of more than 7,400 publications and millions of complete articles.
- SIRS Researcher – a general reference database containing thousands of full-text articles exploring social, scientific, health, historic, business, economic, political, and global issues selected from 1,600 domestic and international publications according to strict criteria with regard to content relevance, reliability, and age appropriateness.

Table 24 reports on the use of these resources in public schools. That the statistics reported in the table are very low can likely be explained as not all buildings had access to each resource and not all populations would be expected to make regular use of each resource. Note that EBSCOhost and Newsbank are made available to districts via their participation in the state-supported MOREnet Technology Network Program (TNP). In 2005, 511 of the 524 districts, and the state schools for the blind and deaf, were TNP customers.

Table 24

Buildings Reporting Use of Electronic Resources, by User Type - 2005

Resource	Principals	Teachers	Students
EBSCO host	472	1,335	1,019
Electronic encyclopedia	425	1,463	1,415
Gale	126	409	320
Newsbank	181	448	389
ProQuest	85	191	152
SIRS	105	321	279

Overall, the data represented in Table 24 are disappointing at best. It is apparent that the state needs to take some action. Steps might include information dissemination and the offering of workshops that explain what is available and how to access and make use of these resources in meaningful ways.

Item 16 – Routine technology use, by function
This item has typically asked building contacts to estimate the percentages of administrators (e.g., principals), teachers, and students that routinely use computers and computer technologies for specific functions. Tables 25 through 27 illustrate such technology usage for 1999 through 2005. While in some instances the 2005 responses are the highest ever reported, there are other instances of only modest increases and some categories that are still below expectations. Note that "routine use" was upgraded in 2004 to indicate three or more times per week.

Table 25 details routine technology use by school principals. Reflecting their responsibilities, these educators are more apt to use technology for research, writing, email, and student data manipulation than for curriculum and instruction. Over the years, the areas where principals show the greatest increase in usage include the use of technology to track student performance, manage student records, conduct research, and assess student performance. In terms of 2005 responses, the greatest increases involve communicating electronically with peers, experts, or and others, followed by the production of media, web, or multimedia products or presentations for demonstration purposes, and participating in online coursework. Principals show slight decreases in technology uses related to preparing lesson plans or delivering instruction and conducting online research.

Table 25

Routine Use of Technology by Building Principals, 1999-2005

Technology Function	1999	2000	2001	2002	2003	2004	2005
Produce media/presentation products	26%	29%	31%	43%	46%	50%	54%
Produce written products	65%	68%	56%	67%	73%	77%	79%
Conduct online research	57%	62%	58%	69%	79%	80%	78%
Communicate with peers, experts, others	53%	58%	48%	63%	79%	87%	93%
Communicate with parents and students	NA	NA	NA	NA	NA	NA	81%
Prepare lesson plans	8%	9%	13%	14%	16%	15%	11%
Manage student records	61%	66%	60%	71%	81%	83%	82%
Track student performance	49%	54%	56%	67%	78%	81%	80%
Assess student performance	NA	NA	NA	58%	67%	72%	71%
Deliver/present instruction	13%	18%	21%	28%	37%	39%	37%
Enroll in online coursework	NA	NA	NA	NA	4%	7%	11%

Table 26 covers routine teacher use of technology. Just fewer than 80 percent of teachers typically use technology for writing, 75 percent for research information collection and keeping track of student performance, 73 percent to help manage student records, and 70 percent to assess student performance. Technology usage has remained fairly stable for the past three years. Areas where teachers show the greatest increases in routine use from 2003 to 2005 include the use of technology to communicate with parents and students (from 62 to 72 percent), manage student records (64 to 73 percent), assess student performance (64 to 70 percent), track student performance (69 to 75 percent), and deliver/present instruction (46 to 57 percent). Except for the latter, many of these were areas of greatest increase for building principals as well.

Table 26

Routine Use of Technology by Teachers, 1999-2005

Technology Function	1999	2000	2001	2002	2003	2004	2005
Produce media/presentation products	20%	24%	29%	37%	43%	47%	48%
Produce written products	62%	66%	60%	71%	77%	81%	79%
Conduct online research	54%	59%	56%	67%	74%	75%	75%
Communicate with peers, experts, others	NA	NA	NA	NA	50%	68%	85%
Communicate with parents and students	41%	46%	39%	53%	62%	66%	72%
Prepare lesson plans	42%	47%	45%	59%	64%	66%	66%
Manage student records	40%	45%	46%	56%	64%	70%	73%
Track student performance	47%	52%	48%	61%	69%	74%	75%
Assess student performance	NA	NA	NA	55%	64%	69%	70%
Deliver/present instruction	20%	26%	29%	38%	46%	51%	57%
Enroll in online coursework	NA	NA	NA	NA	5%	9%	11%

Table 27 depicts routine student use of technology. While students routinely use technology more than they did in 1999, their usage rates generally lag behind those noted for teachers and administrators. In 2005, the only category with over half of students making routine use involves online research. Areas for which an increase was noted from 2004 to 2005 include media presentations (29 to 40 percent), written products (46 to 59 percent), and email to communicate with peers or experts (12 to 20 percent) and with parents (seven to 13 percent). However, statistics related to writing and research didn't match their pre-2004 levels, at which time routine use was set at three or more times per week.

Table 27

Routine Use of Technology by Students, 1999-2005

Technology Function	1999	2000	2001	2002	2003	2004	2005
Produce media/presentation products	18%	22%	23%	32%	37%	29%	40%
Produce written products	58%	61%	52%	65%	68%	46%	59%
Conduct online research	52%	57%	49%	59%	63%	NA	53%
Communicate with peers, experts, others	NA	NA	NA	NA	NA	12%	20%
Communicate with parents and students	NA	NA	NA	NA	NA	7%	13%
Enroll in online coursework	NA	NA	NA	NA	NA	7%	2%

Item 17 – Technology integration support
Table 28 indicates the positions available in, or available to, the school building for leadership in integrating technology into curriculum and instruction in 2003 and 2004. Integration assistance is typically the charge of a district or building technology coordinator and/or administrator. With increases in the numbers of buildings reporting assistance from persons residing in the

buildings – such as a library media specialist, instructional technology specialist, or teacher – schools should be in better position to respond to instructional support needs.

Table 28

School Leaders in Technology Integration, 2003-2005

	Percent Buildings Reporting		
Position Responsible for Providing Assistance	2003	2004	2005
School building administrator	53%	57%	53%
Technology coordinator (any)	49%	58%	NA
• District technical staff	NA	NA	47%
• School technical staff	NA	NA	20%
Teacher(s)	46%	48%	52%
Instructional technology specialist	24%	32%	34%
Library media specialist	43%	54%	58%

Item 18 – Teacher technology integration
Added in 2002, this item asked the building contact to estimate the percentage of teachers who fully integrate technology into curriculum and instruction. Based on the eMINTS instructional model, full integration is defined as the "ability to use instructional strategies that promote authentic project-based learning opportunities, student teamwork, collaboration and communication using technology in the classroom curriculum". Table 29 indicates that half of the teachers meet this standard, compared to 53 percent in 2004, 41 percent in 2003, and 33 percent in 2002.

Table 29

Percent Teachers Integrating Technology, 2002-2005

	2002	2003	2004	2005
Teachers fully integrating technology	33%	41%	53%	50%

Item 19 – Technology-mediated feedback systems
Another item added in 2002 to align with the state plan, this last item asked about technology-mediated feedback systems in place to help facilitate effective communication between schools and patrons, including students and parents. In 2005, all but 79 buildings indicate making use of some system, compared to 129 buildings in 2004. Table 30 indicates, as noted the previous three years, the most commonly used systems include email and voice mail. Note, however, that the use of the Web for communication tripled from 2004 to 2005 (from under 200 to over 600 buildings).

Table 30

Percent Buildings with Technology-mediated Feedback Systems, 2002-2005

	Number of Buildings			
Feedback System	2002	2003	2004	2005
Email	822	2,007	2,207	2,075
Voice mail	546	1,053	1,037	1,115
Listserv	28	354	300	287
Automated absentee calling system	179	296	283	416
Homework hotline via telephone	221	280	281	331
Homework hotline via Web	62	160	185	611

Appendix A

Missouri Census of Technology	**DISTRICT Level Census Form (2005)**

Complete this census form to reflect district technology status as of **March 1**.
It is recommended that you make a copy of the completed census for your files.
Consult the Core Data Manual and Help file, call (573) 751-8247, or e-mail: instrtech@dese.mo.gov for assistance as needed.

N=524

1) Year district technology plan was last approved by DESE (prefilled from section files): 417 in 2003, 66 in 2004, 51 in 2005

2) Board-approved education technology standards and population(s) that must meet the standards.
   STANDARDS (Check ALL that apply)
   431 82% Locally-developed
   151 29% Adopted National Educational Technology Standards (ISTE)
   42   8%   Adopted Standards for Technological Literacy: Content for the Study of Technology (ITEA)
   19   4%   Other: 6=Show-Me Standards
   55   10% None

   POPULATIONS (Check ALL that apply)
   Students:
   426 81% PreK-2
   440 84% 3-5
   457 87% 6-8
   388 74% 9-12
   54   92% Area career center (N=59)
   52   10% None

   Staff:
   403 77% Administrators
   412 79% Teachers
   360 69% Support services staff
   106 20% None

3) Estimated total FTE of district-level staff directly responsible for technical maintenance and support of hardware.
   Average = 2.1   Median = 1   [18 districts reported 0.0 FTE]

4) District-supported administrative systems. (Check ALL that apply)

513	98%	Accounting/budgeting/payroll	393	75%	Grade book	488	93%	Student attendance
271	52%	Classroom website hosting	374	71%	Health Service	226	43%	Student fees
478	91%	Communication/email	166	32%	Human resources	341	65%	Student performance
364	70%	Course scheduling	382	73%	IEP management	133	25%	Teacher evaluations
402	77%	Discipline	136	26%	Instructional management	271	52%	Technical support
193	37%	Distance education	283	54%	Inventory	217	41%	Transportation
190	36%	Extra curricular scheduling	475	91%	Library catalog	0	0%	None
420	80%	Food Service	104	20%	School safety			

5) All buildings in district are connected through a wide or local area network 457 / 87% =Yes   67 / 13% =No

6) Core content area(s) in which technology is integrated. (Check ALL that apply)
   505 / 96% =Communication Arts   463 / 88% =Mathematics   474 / 90% =Science   462 / 88% =Social Studies

7) Estimated percentage of following populations with district-provided email accounts.
   [Number of districts, Percent of all districts, Median percentage rate of accounts for responding districts]

   STUDENTS:
   13   2%   100% PreK-2
   33   6%   85%   3-5
   51   10%   95%   6-8
   108 21%   30%   9-12
   401 77%   -   None

   STAFF:
   502 96%   100% Administrators
   495 94%   100% Teachers
   472 90%   100% Support Services Staff
   21   4%   -   None

8) Estimated percentage of district 8th graders who are technologically literate. Median = 90%

9) Amount budgeted for technology for current year. [N = 521 with 3 districts reporting $0.00]
   Total = $105,861,118   Average = $202,025   Median = $40,900

10) Dollar value of district E-rate discount for current year (per funding commitment decision letters). [N = 414 districts]
    Total = $29,737,757.49   Average = $74,344   Median = $10,045

11) Estimated percentage of E-rate discount used to support education technology.   Median = 80%

Complete this census form to reflect school building technology status as of **March 1**.
It is recommended that you make a copy of the completed census for your files.
Consult the Core Data Manual and Help file, call (573) 751-8247, or e-mail: instrtech@dese.mo.gov for assistance as needed.

N = 2211

PLANNING

1) Type of school building technology plan: 127 / 6%Stand-alone plan 2029 / 92%Integrated in district plan 41 / 2%Do not have plan

TRAINING

2) Estimated percentage of faculty/staff in school building at each skill level of technology use.

FACULTY/STAFF:	BEGINNER	INTERMEDIATE	ADVANCED	TOTAL
Administrator(s)	9.2%	66.9%	23.9%	100.0%
Teachers	19.4%	59.1%	21.4%	99.9%
Technology support staff	2.3%	16.2%	81.5%	100.1%
Support services staff	30.9%	51.8%	17.4%	100.0%

3) Number of eMINTS-trained teachers in school building.

361 in 183 buildings Completed year 1 only   710 in 259 buildings Completed both year 1 and 2
[Totals: Teachers = 1071 & Buildings = 345]

HARDWARE AND SUPPORT

4) Estimated total FTE of school building staff or others directly responsible for technical maintenance and/or support of hardware.

EMPLOYEES:					NON-EMPLOYEES		
1754	79%	District staff	FTE:	2.66	281	13%	Students
679	31%	School certificated staff	FTE:	1.19	34	2%	Parents/community members
534	24%	School non-certificated staff	FTE:	1,05	716	32%	Vendors/contractors
94	4%	None			1278	58%	None

[Overall Average = 2.73]

5) Computers by type and location within school building.

COMPUTER PLATFORM	COMPUTER LABS	PreK-2	INSTRUCTIONAL ROOMS 3-5	6-8	9-12	ACC	LIBRARY CENTERS	ADMIN. OFFICES	TOTAL
APPLE/MAC									
LC series and lower	796	1108	930	200	158	14	134	59	3399
Power Mac series	946	1154	867	809	577	90	251	63	4757
G3	7311	3254	3996	3245	2603	212	2290	807	23718
G4 or later	4373	943	1568	1018	1587	287	1131	491	11398
Sub-Total	13426	6459	7361	5272	4925	603	3806	1420	43272
PC COMPATIBLE									
486 or earlier	345	455	481	255	391	31	235	107	2300
Pentium I or II	8774	5349	6122	5933	8106	801	3371	1981	40437
Pentium III	17894	5784	7851	8067	11248	1479	4236	4064	60623
Pentium IV or later	33167	7155	11783	9530	15217	3543	6644	8382	95421
Celeron	8979	3083	4694	3467	5661	442	2424	1623	30373
AMD (< 450 MHz)	3641	1146	1744	1136	2628	281	1213	829	12618
AMD (450+ MHz)	1034	387	528	499	821	79	355	179	3882
Sub-Total	73834	23359	33203	28887	44072	6656	18478	17165	245654
Total Mac/PC	87260	29818	40564	34159	48997	7259	22284	18585	288926
HANDHELDS	565	814	3249	1955	2082	111	179	1232	10187
TOTAL	87825	30632	43813	36114	51079	7370	22463	19817	299113

6) Internet connected and multimedia equipped computers by location in school building.

COMPUTER TYPE	COMPUTER LABS	INSTRUCTIONAL ROOMS					LIBRARY CENTERS	ADMIN. OFFICES	TOTAL
		PreK-2	3-5	6-8	9-12	ACC			
Internet connected	79841	25474	37537	30821	44469	5897	20533	17360	261932
Multimedia equipped	76825	24570	35385	28776	41102	5489	18863	16295	247305

7) Percentage of computers connected to the Internet by type of connection.

COMPUTER TYPE	WIRED CONNECTION	WIRELESS CONNECTION	TOTAL
Desktop	98%	2%	100%
Laptop	69%	31%	100%

8) Technology by type and location within school building. * – Data not available due to technical issues

NUMBER OF ROOMS…	LABS	INSTRUCTIONAL ROOMS					LMCs	ADM.	TOTAL
		PreK-2	3-5	6-8	9-12	ACC			
total	*	*	*	*	*	*	*	*	*
• with telephone access	*	*	*	*	*	*	*	*	*
• with Internet access (wired or wireless)	*	*	*	*	*	*	*	*	*
• with one or more multimedia-equipped computers	*	*	*	*	*	*	*	*	*
• with one or more multimedia-equipped computers connected to Internet	*	*	*	*	*	*	*	*	*
• with one or more multimedia-equipped and Internet-connected computers and access to a printer, and a dedicated projection device	*	*	*	*	*	*	*	*	*

9) Library automation system used in school building. (Check the product name).

152	7%	Alexandria	138	6%	Dynix	57	3%	SIRSI	84	4%	Other
53	2%	Alice	767	35%	Follett	417	19%	Winnebago	89	4%	None
335	2%	Athena	36	2%	Gateway						

10) Estimated typical (average) timeframe for resolving minor or routine technical problems/repairs.

716	32%	1 working day	291	13%	4-6 working days	32	1%	11 working days or more
1074	49%	2-3 working days	84	5%	7-10 working days			

11) Estimated percentage of computers in working order on a typical (average) day: Median = 98%

INTERNET CONNECTIVITY- DISTANCE LEARNING

12) School building Internet connection by bandwidth and delivery mode.

BANDWIDTH:

90	4%	56kb – 384 kb
1452	66%	385kb – 1.5mb (T1)
324	15%	1.6mb – 9.9mb
116	5%	10mb – 45mb
57	3%	45mb – 100mb
152	7%	>100mb
13	<1%	None
7	<1%	Other

DELIVERY MODE:

846	38%	Copper line
1009	46%	Fiber
69	3%	DSL
7	<1%	Satellite
165	7%	Other: 95=Radio/Wireless/Point-to-Point 36=Frame Relay
54	2%	None

13) Estimated percentage of computers connected to school building LAN (or district WAN): Median = 100%
[3 buildings reported no connected computers]

14) Distance learning system(s) available to students in school building. (Check ALL that apply)

485	22%	I-TV: two-way interactive (audio and video) television	60	27%	Other
270	12%	Desktop video conferencing: two-way interactive	551	25%	None
703	32%	Web-based online instruction via Internet: non-interactive			
399	18%	Satellite: one-way instructional video			
1140	52%	Cable TV: one-way instructional video			

TECHNOLOGY USAGE

15) Estimated percentage of administrators, teachers, and students routinely using following applications.

APPLICATION	ADMINISTRATORS	TEACHERS	STUDENTS
Educational software	43%	78%	80%
Email	97%	92%	11%
Electronic Resources:			
EBSCO host	17%	23%	21%
Electronic encyclopedia	15%	31%	33%
Gale	3%	6%	7%
Newsbank	4%	6%	6%
ProQuest	2%	3%	3%
SIRS	2%	5%	5%

16) Estimated percentage of administrators, teachers, and students routinely using computers for following functions.

FUNCTION	ADMINISTRATORS	TEACHERS	STUDENTS
Produce media, web, or multimedia products/presentations to demonstrate learning	54%	48%	40%
Produce written or print products/presentations to demonstrate learning	79%	79%	59%
Communicate with peers, experts, others	93%	85%	20%
Communicate with parents and students	81%	72%	13%
Conduct online research	79%	75%	53%
Participate in online courses (this year)	11%	11%	2%
Manage student records (spreadsheet/database)	82%	73%	-
Track student performance	80%	75%	-
Assess student performance	71%	70%	-
Deliver and present instruction	37%	57%	-
Prepare lesson plan(s)	11%	66%	-

17) Estimated total FTE of staff or others directly responsible for integration of technology into curriculum and instruction.

EMPLOYEES:

756	34%	Instructional technology specialist	FTE:	1.18
1273	58%	Library/media specialist	FTE:	1.23
1163	53%	School administrator	FTE:	1.29
1143	52%	Teacher	FTE:	-
432	20%	School technical staff	FTE:	1.32
1040	47%	District technical staff	FTE:	1.38
154	7%	Other	FTE:	-
150	7%	None		

NON-EMPLOYEES:

38	2%	Students
196	9%	Regional center/RPDC
68	3%	Other (specify): 31=Contractor/Vendor
1883	85%	None

[Overall Average FTE = 2.07]

18) Estimated percentage of teaching staff fully integrating technology into curriculum and instruction: Median = 50%

19) School (or district) supported technology-mediated feedback. (Check ALL that apply)

416	19%	Automated absentee calling system	287	13%	Listservs
290	13%	Electronic bulletin board	1115	50%	Voice Mail
2075	94%	Email	50	2%	Other (specify):
611	28%	Homework hotline via web	79	4%	None
331	15%	Homework hotline via telephone			

Appendix B

Cross Reference of 2005 COT Items and METSP Goals and Objectives, by METSP Goal

METSP Goal and Objective	COT Item
1. Student Learning	
a. State Board endorses/adopts student technology standards	NA
b. Districts establish/endorse student technology standards	District 2
c. Students will be technologically literate by end of eighth grade	District 8
d. Students routinely use Web and educational software	Building 15
e. Students routinely use technology to conduct research and produce products	Building 16
f. Sample of eMINTS student will score satisfactory or above on the MAP reading test	NA
g. 5% fewer of eMINTS sample students will score in Step 1 or Progressing on the MAP annually	NA
h. eMINTS sample students in special categories will perform better, on average, on the MAP than non-eMINTS students	NA
i. High schools will provide courses via distance learning	NA
2. Teacher Preparation	
a. State Board establishes or endorses teacher technology standards	NA
b. Districts establish/endorse teacher technology standards	District 2
c. Districts integrate technology into the core curriculum areas	District 6
d. Teachers possess intermediate or advanced technology skills	Building 2
e. Teachers routinely use Web and educational software	Building 15
f. Teachers routinely use technology to conduct research, prepare lessons, assess and manage student data, produce presentations and deliver instruction	Building 16
g. Teachers fully integrate technology in curriculum and instruction	Building 18
h. Elementary buildings will have at least 2 eMINTS trained teachers	Building 3
3. Administration/Management	
a. State Board establishes or endorses administrator technology standards	NA
*Districts establish/endorse administrator technology standards <Added 2003>	District 2
b. Districts have state-approved technology plans, tied to CSIPs, address all TFAs, promote PD, and make use of E-rate	District 1, 10, 11
c. Districts partner with business / higher education to help with technology planning, implementation or evaluation	Deleted 2005
d. Building administrators possess intermediate or advanced technology skills	Building 2
e. Districts provide email accounts to administrators, teachers, and support staff	District 7 & 4
f. Building administrators routinely use Web and education software	Building 15
g. Principals routinely use technology for data management, assess and track student performance, communicate with others	Building 16
h. Buildings have technology- mediated feedback system(s)	Building 19
4. Equitable Access	
a. Districts maintain adequate LAN, connected to Internet	District 5
b. Buildings are connected to district LAN/WAN, connected to Internet, providing web and email services	District 5
c. Buildings have video conferencing and/or multimedia distribution system	Building 14
d. Classrooms are equipped with full teacher workstations and Internet-connected computers at 2:1 ratio of computers to students	Building 5, 6, 8
5. Technical Support	
a. Districts employ/contract technical staff	District 3
b. Buildings have on-site technical support (both technical and instructional)	Building 4, 17
*Buildings have technical problems/repairs fixed in 3 working days <added 2004>	Building 10, 11

Cross Reference of 2005 COT Items and METSP Goals and Objectives, by COT Item

District Census	METSP Goal
1. Year technology plan approved by state	3.a.
2. Board-approved education technology standards, by kind and population	1.b., 2.b.
3. District staff responsible for technical maintenance and support	5.a.
4. District-supported administrative systems	3.e.
5. District building(s) and administrative office(s) networking	4.b.
6. Core curriculum areas where technology is integrated	2.c.
7. District-provided email accounts, by user type and [student] grade levels	3.c.
8. Percent eighth-graders technologically literate	1.c.
9. Technology budget for current year	3.b.
10. E-rate discount amount for current year	3.b.
11. Percent E-rate discount budgeted back into education technology	3.b.

School Building Census	METSP Goal
Technology Planning	
1. Building technology plan status (stand-alone or part of district plan)	NA
Technology Professional Development	
2. Technology skill levels of building administrators, faculty, technical, and support staff	2.d., 3.d.
3. Number eMINTS-trained teachers	2.h.
Hardware And Support	
4. Building-level staff responsible for technical maintenance	5.b.
5. Number computers in building, by type and location	4.d.
6. Number Internet-connected and multimedia-equipped computers	(Goals 1,2,4)
7. Number Internet-connected computers by type of computer and type of connection	4.d.
8. Equipment located in instructional rooms, by type of equipment and room	4.d.
9. Automated library system	(Goal 3)
10. Typical timeframe for resolving routine/minor technical problems and repairs	5.b.
11. Percent computers in working order on a typical day	5.b.
Internet Connectivity / Distance Learning	
12. Internet connection bandwidth	4.a.
13. Percent computers connected to building and/or district network	4.b.
14. Distance learning system(s) available in building	1.i.
Technology Usage	
15. Percent administrators, teachers and students routinely using education technologies	1.d., 2.e., 3.f.
16. Percent administrators, teachers, and students routinely using technology functions	1.e., 2.f., 3.g.
17. Building-level staff responsible for leadership in integrating technology into curriculum	2.c., 5.b.
18. Percent of teaching staff fully integrating technology into curriculum and instruction	2.c., 2.g.
19. Technology-mediated feedback system used in the building (or via district)	3.h.